Formulation and Evaluation of Polyherbal Ethosomal Gel

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Abstract:

The present study aims to formulate and evaluate a polyherbal ethosomal gel using ethanolicic extracts of *Nyctanthes arbor-tristis*, *Curcuma longa*, and *Moringa concanensis* for its anti-inflammatory potential. Preliminary phytochemical screening confirmed the presence of bioactive constituents such as alkaloids, flavonoids, phenols, tannins, saponins, and proteins, which are known to contribute to anti-inflammatory and healing activities. Ethosomes were selected as a novel vesicular drug delivery system to enhance the dermal penetration of active phytoconstituents. Ethosomal solutions of plant extracts were prepared and evaluated for key parameters such as vesicle size, zeta potential, and appearance. The ethosomal suspensions exhibited good stability, optimal zeta potential indicating repulsive forces between vesicles, and uniform vesicle size favorable for transdermal delivery. These ethosomal suspensions were further incorporated into a gel base using suitable gelling agents to obtain a polyherbal ethosomal gel. The gel formulations were evaluated for various physicochemical parameters including color, odor, pH, viscosity, spreadability, texture, washability, and extrudability. The results showed that the gel was semisolid, non-irritant, smooth, and had acceptable spreadability and viscosity for easy application. *In-vitro* anti-inflammatory activity was assessed by the protein denaturation method. The gel exhibited concentration-dependent inhibition of protein denaturation, showing significant results when compared to the standard drug diclofenac sodium.

Keywords: *Nyctanthes arbor-tristis*, ethosomes, polyherbal gel, anti-inflammatory

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